Great Recipes: Creating Corequisite Contemporary Math from Scratch
Title III Grant

5 year plan to redesign gateway courses & math pathways

Preparation Time:

Recommended: ONE YEAR
Minimum: One Semester
Yes, it really takes a year!

- August
  - Recruit Team
  - Set goals/expectations
  - Meet with other programs
- September
  - Request data from IR/IE
  - Research!
- October/November
  - Attend conferences
- December
  - Research content;
  - Schedule a content expert;
  - Decide on Co-Requisite format
- January/February
  - Schedule fall pilot classes
- February/March
  - Learn from content expert
- April/May
  - Develop course materials
Ingredients
Collaboration

Many hands make light work...

It takes a team of people working together an entire year

Beware: too many cooks spoil the broth
Diverse Teams make better decisions up to 87% of the time - Eric Larson
Communication

Collaboration

It takes a team of people working together the entire year

- Frequent discussion WITHIN the math team
- A willingness to dialogue with & listen to other departments for WHAT MATH SKILLS THEY NEED!
- Work with advising to promote changes throughout the college
Who is in the room?

“A psychologically safe environment ignites cognitive diversity and puts different minds to work on the bumpy and difficult journey of strategy execution.”

Faculty need to feel “safe” to bring forward new ideas

Need a Department Head and/or Division Chair to help facilitate decisions
Critical Thinking

Collaboration

It takes a team of people working together the entire year

Communication

• Frequent discussion WITHIN the math team
• A willingness to dialogue with & listen to other departments for WHAT MATH SKILLS THEY NEED!
• Work with advising to promote changes

• Research current best practices (even in other disciplines!) – get advice from experts!!
• Gather and analyze data to see what it says rather than finding numbers to say what you want!
• Weigh pros and cons to make decisions that are best for students!
What research? What data?

- Complete College America - the good, the bad, and the ugly
- Other Colleges and Publishers
- Institutional Effectiveness/Institutional Research - Official College Data!
  - Three years worth of data
  - All grades awarded by term
  - Overall Course Outcomes (ABC success, non-success, withdraw) by:
    - Term
    - Instruction Mode
    - Campus/location
    - Student Attributes (Gender, Age, Pell Eligibility, Underrepresented Minority, Gender and Underrepresented Minority, Enrollment Date, Previous Math Course)
Creativity

Collaboration
It takes a team of people working together the entire year

Communication
• Frequent discussion WITHIN the math team
• A willingness to dialogue with & listen to other departments for WHAT MATH SKILLS THEY NEED!
• Work with advising to promote changes

Critical Thinking
• Research current best practices (even in other disciplines!) – get advice from experts!!
• Gather and analyze data to see what it says rather than finding numbers to say what you want!
• Weigh pros and cons to make decisions that are best for students!

• Try something new!!
• Abandon “...but we’ve always done it this way!”
• Develop the IDEAL course structure
  o Then, work with resources and administration to see how you can make it work
  o Avoid limiting your efforts because of doubts or anxiety about what might work

*Often takes an outside impetus to make change
Additional Ingredients:

GET HELP FROM AN EXPERT!

TEXTBOOK AUTHORS CAN BE A GREAT RESOURCE!
DIRECTIONS

• Set regular meeting dates
• Map out conferences
• Invite speakers
• Set goals and deadlines
• Complete the structure by the half-way point
• Develop course materials:
  • Course Syllabus
  • Course Schedule/Calendar
  • Common Homework Shell
  • Common Assessments
  • Shared Activities
• Professional Learning Community
December Workgroups

• Decide how to format co-requisite course
• 2 credit hours
• Meets like a normal 3 credit hour class
• Split or Paired model*
• Taught by same instructor
• Different computer system for support course
Mandated changes to developmental pathways and ‘zero-credit’ courses

- **Community College of Baltimore County**
  Split Model:
  CPE Grant supported small co-requisite class size:
  12 college-ready students + 12 developmental students

  Courses can have at most *ONE* zero-credit pre-requisite (gone is the 3-course developmental pathway!)

- **Austin Peay State University – Paired Model**
  (subsequent change: co-requisite courses have to be 100 level)
Scheduling Options:

Monday/Wednesday or Tuesday/Thursday – back to back

Monday/Tuesday/Wednesday/Thursday – same time
The sole purpose of the co-requisite class is to help the student pass their college-level math class.
Essential Skills

Front-load essential skills into the beginning of the co-requisite course!

- Growth Mindset
- Time Management
- Study Skills
- Math Anxiety
- Test Taking Skills
- Metacognition
- Relaxation Techniques
- Benefits of working in groups
Math Support

Contemporary College Math
Fairness Criteria for voting
Number Sense
Measurements/Conversion
Percentages
Percents/Fractions/Decimals
Financial Calculations
Calculator Skills
Using Excel for Statistics

in the Corequisite

College Algebra
Basic Graphing
Foil/Multiplying binomials
Factoring
Reducing Radicals
Quadratic Formula
Exponent Rules
Synthetic/Long Division
Log Support

IN ALL THINGS: RELATIONSHIP!
CONTENT REVIEW!!

- What topics need to be covered?
- How in-depth should something be covered?
- What textbook?
- Online homework?
- Incorporation of technology?
Active Learning

From Title III Grant:
Course redesign will “infuse courses with high impact instructional strategies proven effective with under-prepared learners...by incorporating active learning (inclusive of collaboration & project-based strategies), contextualized learning, and lecture capture instructional strategies”
Start of Class

- MAT 146 Full Syllabus
- MAT 146 Short (1 page front/back) Info Sheet Syllabus
- Calendar
- Mindset Worksheet
- TrainUgly Growth Mindset video - do you want this video listed under Softskills?!
- Murder Mystery Clues Activity
- Lost at Sea
- Student Contract
- Syllabus Scavenger Hunt

Voting and Dimensional Analysis

- Voting Project
- Formula Sheet
- Unit 1 Test
- Voting Activity
- Jigsaw Voting Theory Activity
- Jigsaw Voting Theory KEY
- IFAT Conversion Worksheet for scratch off card D015
146S Co-requisite Supplement Materials

- MAT 146S Information Sheet
- MAT 146S Full Syllabus
- MAT 146 Short (1 page front/back Info page) Syllabus
- How Learning Math is Different video (study skills series)
- How Stress Affects the Brain (Ted-Ed talk)
- Positive Mental Attitude Article/Assignment
- Time Management
  - Time Management Worksheet
  - Time Management video (study skills series): https://www.youtube.com/watch?v=PgDKVUqVVOM
  - Pomodoro Time Management Technique (link): https://francescocirillo.com/pages/pomodoro-technique
- Math and Test Anxiety video: https://www.youtube.com/watch?v=vRwJFt90htk
- Test Taking Skills video: https://www.youtube.com/watch?v=YSD0HGtbBFk
- Unit 1 Test Reflection
MAT 150/100 Activities

Please denote whether your activity is for MAT 150, 100, either, or both! Be sure to include any directions that other instructors might need.

- Which is a Function?  MAT 150
  - Make a complete set for each group of ~4 students
  - Cut each square and put them all on the table for the group to sort
  - Probably need to discuss why #13 is a “no” (there’s no “y =”); put it in desmos to see the graph!!

- GO TO THE BOARD - 1.2, 1.3
  - graphing functions
  - properties of functions [domain, range, even, odd, neither, incr, decre, constant, max, min]
  - travel (and students introduce themselves to each new partner)

100 Co-requisite Supplement Materials

- *MAT 100 Syllabus is in the Start of Class Folder*
- Growth Mindset Video (Train Ugly - To Get Better You Have to Get Ugly)
- How Learning Math is Different video (study skills series)
- How Stress Affects the Brain (Ted-Ed talk)
- Positive Mental Attitude Article/Assignment
- Math Stress and Anxiety Information/Assignment
- Ten Tips for Test Anxiety
- Top Skills in Demand
- Relaxation Techniques
- Time Management
  - Time Management Worksheet
  - Time Management video (study skills series): https://www.youtube.com/watch?v=PgDKVugWOM
  - Pomodoro Time Management Technique (link): https://francescocirillo.com/pages/pomodoro-technique
- Math and Test Anxiety video: https://www.youtube.com/watch?v=rWjFr90htk
- Test Taking Skills video: https://www.youtube.com/watch?v=VSD0HgtbBFk
- Unit 1 Test Reflection
Pilot elements

Common elements
- Same textbook
- Same computer shell & HW
- Common syllabus
- Same tests
- SAME PROJECTS

Projects
- Voting theory project
- Finance unit project
- Probability project*
- Final project
- Analytic rubrics

Active learning
- IFAT: instant feedback assessment technique (scratch-off cards)
- Jigsaw technique
- Kahoot!
- Pair-share, etc
Contemporary College Math

- Get students out of the College Algebra pipeline
- Work with programs for course content
  - Nursing!
  - Statistics Instructors as pre-requisite
- Increased number of sections by 350%!
Initial Success...

- Increased pass rates (in college math) for developmental math students by 230%
- Students now complete QR (AA) math requirement IN ONE SEMESTER!
- Increased course pass rates overall by 24%
Subsequent Challenges!

- Wider net – more variations
- Philosophical differences
- Dislike of projects (groups)
- Inclusion of online sections = drop in pass rates
- Finding enough qualified instructors (fewer dev
Positive ‘side effects’

• Increased access for under-represented minorities

• “We expect positive impact on reducing equity gaps in student success”
AMATYC
Equity Committee:
FRIDAY EVENTS!

Panel Discussion: *Perspectives on Key Equity Issues and Practices: 2:00 – 2:50 PM R 101 AB*
Trena L. Wilkerson, Linda M. Fulmore, and Mike Steele

**Equity Committee Meeting:** 4:15 – 5:45 PM R. 102AB
- Equity Position Statement
- How to start equity work at your college
- Collaboration with Project SLOPE
- Plans for other future projects

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Contributors

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John Ward
Debrena Creech
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Friday Evening
November 15, 6 pm – 8 pm
Room 201

*Enlighten Us, But Make It Quick!*

List of Presenters at

#AMATYCIgnite2019
Thank you!
Questions?